Planktonic foraminifera from modern sediments reflect upwelling patterns off Iberia: Insights from a regional transfer function

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Résumé en anglais	Quantitative and qualitative analyses of planktonic foraminiferal assemblages from 134 core-top sediment samples collected along the western Iberian margin were used to assess the latitudinal and longitudinal changes in surface water conditions and to calibrate a Sea Surface Temperature (SST) transfer function for this seasonal coastal upwelling region. Q-mode factor analysis performed on relative abundances yielded three factors that explain 96% of the total variance: factor 1 (50%) is exclusively defined by Globigerina bulloides, the most abundant and widespread species, and reflects the modern seasonal (May to September) coastal upwelling areas; factor 2 (32%) is dominated by Neogloboquadrina pachyderma (dextral) and Globorotalia inflata and seems to be associated with the Portugal Current, the descending branch of the North Atlantic Drift; factor 3 (14%) is defined by the tropical–sub-tropical species Globigerinoides ruber (white), Globigerinoides trilobus trilobus, and G. inflata and mirrors the influence of the winter-time eastern branch of the Azores Current. In conjunction with satellite-derived SST for summer and winter seasons integrated over an 18 year period the regional foraminiferal data set is used to calibrate a SST transfer function using Imbrie & Kipp, MAT and SIMMAXndw techniques. Similar predicted errors (RMSEP), correlation coefficients, and residuals' deviation from SST estimated for both techniques were observed for both seasons. All techniques appear to underestimate SST off the southern Iberia margin, an area mainly occupied by warm waters where upwelling occurs only occasionally, and overestimate SST on the northern part of the west coast of the Iberia margin, where cold waters are present nearly all year round. The comparison of these regional calibrations with former Atlantic and North Atlantic calibrations for two cores, one of which is influenced by upwelling, reveals that the regional one attests more robust paleo-SSTs than for the other approaches.
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